

UNIVERSITY OF JAMMU

(NAAC ACCREDITED A + GRADE UNIVERSITY)
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

NOTIFICATION

(22/Nov/Adp/73)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Competent Bodies, has been pleased to authorize the adoption of the revised Syllabi and Courses of Studies in **Bachelor of Engineering (Mechanical Engineering)** for Semester I & II under the **Credit Based System** as per the model curriculum of the **AICTE** (as given in the Annexure) for the candidates of (Govt./Pvt.) **Engineering Colleges** affiliated with the **University of Jammu** for the Examinations to be held in the years indicated against each Semester as under:-

Branch	Semester	For the Examination to be held in the years
Mechanical	Semester-I	December 2022, 2023, 2024 and 2025
	Semester-II	May 2023, 2024, 2025 and 2026

The Syllabi of the course is available on the University Website: www.jammuuniversity.in.

Sd/-
DEAN ACADEMIC AFFAIRS

No. F.Acd/III/22/9976-9984

Dated: 22/11/2022

Copy for information & necessary action to:-

1. Dean Faculty of Engineering
2. Principal, GCET MBSCET BCET YCET
3. C.A to the Controller of Examinations
4. Deputy Assistant Registrar (Exams. Confidential)
5. incharge University Website

Sumitasharma
22/11/22
Deputy Registrar (Academic)

MS
22/11/22

MS
22/11/22

**B.E. Mechanical Engineering First Semester Examination to be held in the
Year December 2022, 2023, 2024, 2025**

Contact Hrs.: 25 hrs.

COURSE CODE	COURSE TYPE	COURSE TITLE	Load Allocations			Marks Distribution		Total Marks	Credits	% Change
			L	T	P	Internal	External			
BST1101	Basic Science Course	Engineering Mathematics I	2	1	0	50	100	150	3	100
BST1102	Basic Science Course	Applied Engineering Chemistry	2	1	0	50	100	150	3	100
HMT1101	Humanities & Management Course	Technical Communication Skill	2	0	0	25	75	100	2	100
MET5101	Engineering Science Course	Engineering Mechanics	2	1	0	50	100	150	3	100
CST3101	Engineering Science Course	Computer Programming	2	1	0	50	100	150	3	100
BSP1112	Basic Science Course	Applied Engineering Chemistry (Lab)	0	0	2	50	-	50	1	100
HMP1111	Humanities & Management Course	Technical Communication Skills (Lab)	0	0	2	50	-	50	1	100
MEP5111	Engineering Science Course	Engineering Mechanics (Lab)	0	0	2	50	-	50	1	100
CSP3111	Engineering Science Course	Computer Programming (Lab)	0	0	2	50	-	50	1	100
MEP5112	Engineering Science Course	Workshop Technology	0	0	3	50	-	50	1.5	100
TOTAL			10	4	11	475	475	950	19.5	



Examination to be held in the Year December 2022, 2023, 2024, 2025

BRANCH: COMMON TO ALL BRANCHES

CREDITS 3

CLASS: B.E. 1st SEMESTER

COURSE TITLE – ENGINEERING MATHEMATICS-I

COURSE NO.- BST1101

DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
2	1	0	100	50

Course Outcomes: At the end of the course the students will be able to
CO 1 Learn general theorems of calculus, find maximum and minimum value of functions of two variables.
CO 2 Understand the concept of definite integrals.
CO 3 Learn basic concepts of complex trigonometry.
CO 4 Find the rank, eigen values/ vectors of matrices.

SECTION - A

UNIT-I: DIFFERENTIAL CALCULUS

Partial differentiation, Euler's theorem on homogeneous functions, Rolle's theorem, Mean value theorem, Taylor's and Maclaurin's series with remainder, Taylor's series in two variables, Maxima and Minima of functions of two variables, Method of Lagrange's multipliers. (12 hrs)

UNIT-II: INTEGRAL CALCULUS

Definite integrals with important properties, differentiation under the integral sign, Gamma, Beta and error functions with simple problems, double and triple integrals with simple problems. (8 hrs)

SECTION - B

UNIT-III: COMPLEX TRIGONOMETRY

Hyperbolic functions of a complex variable, Inverse Hyperbolic functions, Logarithmic function of a complex variable; Summation of series by C+iS method. (8 hrs)

UNIT-IV: MATRICES

Introduction, Rank of a matrix, Elementary transformations, Elementary matrices, Inverse using elementary transformation, Normal form of a matrix, Eigen values and Eigen vector, Properties of Eigen value, Cayley Hamilton Theorem, Diagonalization of matrix. (14 hrs)

BOOKS RECOMMENDED:

1.	Calculus and Analytic Geometry	Thomas and Finney, 9 th Edition, Pearson, 2002.
2.	Differential Calculus	S. Narayan and P.K. Mittal, S.Chand, New Delhi.
3.	Higher Engineering Mathematics	B.S Grewal, Khanna Publishers, New Delhi
4.	Engineering Mathematics-I	Dr. Bhopinder Singh
5.	Engineering Mathematics-II	Dr. Bhopinder Singh

NOTE: There shall be total eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of calculator is allowed.

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Examination to be held in the Year December 2022, 2023, 2024, 2025

BRANCH: MECHANICAL/ CIVIL ENGINEERING

CLASS: B.E. 1st SEMESTER

COURSE TITLE – APPLIED ENGINEERING CHEMISTRY

COURSE NO.- BST1102

DURATION OF EXAM: 3 HOURS

CREDITS: 3

L	T	P	MARKS	
			THEORY	SESSIONAL
2	1	0	100	50

COURSE OUTCOMES: On completion of the course the students will be able to:	
CO1	Know the importance of green chemistry and apply the knowledge of Drugs in day to day life.
CO2	Summarize the different types, preparation and uses of Explosives and the importance of Nano particles.
CO3	Acquire Knowledge about the identification of newly synthesized products through Spectroscopy.
CO4	Get acquainted with the basic knowledge of various Electrochemical Cells, metallic corrosion.
CO5	Get acquainted with various chemical processes encountered in the water softening and the impact of lubrication in machinery.

SECTION – A

Unit – I GREEN CHEMISTRY, FUEL AND DRUGS

Green Chemistry: Definition and Need of Green Chemistry, Principles and Applications of Green Chemistry.

Fuels: Characteristics of a good Fuel, calorific value and types of Fuels.

Drugs: Definition, structure and applications of following drugs: -

- Tranquilizers
- Antibiotics

(8 hrs)

Unit – II NANO CHEMISTRY AND EXPLOSIVES

Nano Chemistry: Introduction and properties of nano particles, nano materials- Graphene and Fullerenes.

Explosives:- Definition, classification, preparation and uses of TNT and RDX.

(6 hrs)

Unit – III SPECTROSCOPIC TECHNIQUES AND APPLICATIONS

UV Spectroscopy: Principle, Band nature of UV Spectrum, types of electronic transitions and applications.

IR Spectroscopy: Principle, molecular vibrations and applications.

NMR Spectroscopy: Principle, shielding and de-shielding, equivalent and non-equivalent protons, chemical shift and applications of NMR.

(8 hrs)

SECTION – B

Unit – IV MATERIAL SCIENCE

Material Science: Types, Properties and importance of materials: Metals, Semiconductors and Insulators.

Electrochemistry: Introduction to Electrolysis and Faraday's laws, Electrochemical cells: Galvanic cell and its application. Mass transfer by electroplating and diffusion.

Corrosion: Dry and wet corrosion, factors influencing rate of corrosion, Remedial Measures against corrosion –cathodic protection, Protective Coatings- galvanizing.

(10 hrs)

Unit – V WATER TREATMENT AND LUBRICANTS

Water Treatment: Introduction, softening of water by Zeolite and ion-exchange processes, priming and foaming, sludge and scale formation, determination of hardness of water by EDTA method, Numerical on hardness and softening of water.

Lubricants: Classification, mechanism and importance of lubricants.

(10 hrs)

Books Recommended:

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|--|---------------------|
| 1. Engineering Chemistry | Sharma, B.K. |
| 2. Material Science and Engineering | William Callister |
| 3. An introduction to Nanomaterials and Nano science | A.K Das & Mahua Das |
| 4. Spectroscopy of Organic Compounds | Kalsi, P.S. |

Reference Books:

- | | |
|--------------------------------------|------------------|
| 1. Engineering Chemistry | Shashi, Chawla |
| 2. Spectroscopy of Organic Compounds | Silverstein |
| 3. Electrochemistry | Samuel Glasstone |

NOTE: There will be total eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section.

Deepavika

Examination to be held in the Year December 2022, 2023, 2024, 2025

BRANCH: MECHANICAL/ CIVIL ENGINEERING

CREDITS: 2

CLASS: B.E. 1st SEMESTER

COURSE TITLE –TECHNICAL COMMUNICATION SKILLS

COURSE NO.- HMT1101

DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
2	0	0	75	25

COURSE OUTCOMES : At the end of this course, students will able to :

CO1	Acquire proficiency in reading, writing, speaking & listening skills
CO2	Equip themselves with grammatical and communicative competence.
CO3	To help them to develop positive attitude & personality to deal with the complexities of life.
CO4	To encourage the all-round development of students by focusing on soft skills.

SECTION-A

UNIT-1: Communication skills & writing practice: Introduction, Elements of Business Communication, Media of Verbal Communication (oral & written), Barriers to Communication, Technology-Enabled Business Communication, **Types of letter-** Inquiry Letter, Reply to Inquiry, Claims Letter, Adjustment and Sales letter, Job Letter. **(8 hrs)**

UNIT-2: Listening skills: Process of Listening, Types of listening, Techniques to improve listening ability, **Group Discussion-**Advantages, Purpose, Group Dynamics, and Guidelines for Effective Group discussion. **Speaking Skills-** Skills of Effective speaking, Tips for writing Scripts and Speeches. **(7 hrs)**

SECTION-B

UNIT-3: Personality Development–Introduction, Importance of Personality Development, Personality Development tips, Different types of Personality, Personality Traits, Personality Disorder, Personality traits of a Good Manager. **(8 hrs)**

UNIT-4: Life Management Skills: Introduction, Need and importance of Life Management Skills, Concept of Hard and Soft skills; Difference between Hard and Soft Skills, **Interviews-** Meaning, Types of Interview, tips for giving an Interview and handling questions. **(7 hrs)**

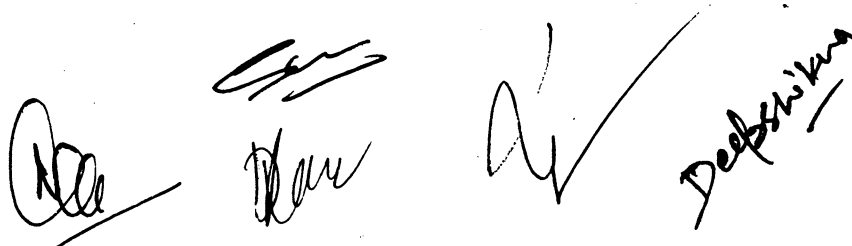
Recommended Books:

- Communication Skills Skills (Second Edition) by Sanjay Kumar & Pushap Lata, Oxford University Press.
- Functional Aspects of Communication Skills by Dr. Prajapati Prasad, Published by S.K Kataria & Sons.

Reference Books:

- An Approach to Communication Skills by Indrajit Bhattacharya, Published by Dhanpat Rai & Co Ltd
- Communication Skills by Varinder Kumar and Bodh Raj, Published by Kalyani Publishers.
- Master of Life Management by Dr.Dantu Murali Krishna, published by Invincible Publishers.
- Kagan Jerome (1969), Personality Development, Harcourt Brace, New York.

NOTE: There shall be total eight questions, four from each section. Each question carries 15 marks. Five questions will have to be attempted, selecting at least two from each section.



Examination to be held in the Year December 2022, 2023, 2024, 2025

BRANCH: MECHANICAL ENGINEERING

CREDITS: 3

CLASS: B.E. 1st SEMESTER

COURSE TITLE – ENGINEERING MECHANICS

COURSE NO.- MET5101

DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
2	1	0	100	50

COURSE OUTCOMES : At the end of this course, students will able to :

CO1:	Understand and analyze system of units and their conversion from one to another.
CO2:	Gather and demonstrate knowledge on basic forces calculation, their resultants and resolution.
CO3:	Gather knowledge and approach to a conclusion of forces causing equilibrium.
CO4:	Be proficient in the use of integral and moment methods for calculating centre of gravity.
CO5:	Develop a stable, environment friendly structure for various engineering purpose using various methods.

SECTION-A

STATICS

Scope and basic concepts (Rigid body, force, units, etc), concept of free body diagram, Resultant of Co-planar concurrent forces in a plane and space, moment of force, Principle of Moments, Coplanar and spatial applications. Virtual work method and its applications.

Analysis of trusses, Equilibrium and its equations for a planar and spatial systems, Method of joints and sections. Theory of friction, its laws and applications (inclined plane). Square threaded screws, Bolt friction, Centroids and center of gravity, centroids of lines and composite areas, centroids determined by integration. Moment of inertia, Area M.O.I, Transfer theorems, Polar M.O.I, Product of inertia, Principal M.O.I, Mohr's circle for area M.O.I, Transfer theorems and axes M.O.I of composite bodies. (20 hrs.)

SECTION-B

DYNAMICS

Kinematics of a particle rectilinear motion, motion curves, Rectangular components of curvilinear motion, Flight of Projectile, Normal and tangential components of acceleration, Radial and transverse components, Newton's Laws. D'Alembert's Principle.

Kinematics of rigid bodies: Types of rigid body motion, Angular motion, fixed axis rotation, Analysis of plane motion and its applications, Instantaneous center and Instantaneous axis of rotation.

Kinetics of Particle: Translation, Analysis of a particle as a rigid body.

Kinetics of rigid bodies: Equations of plane motion, fixed axis rotation, Rolling bodies, General plane motion, Impulse and momentum in plane motion, Angular momentum. (20 hrs.)

RECOMMENDED BOOKS:

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|---|-----------------------------------|
| 1. Engineering Mechanics (Statics & Dynamics) | Beer and Johnson |
| 2. Engineering Mechanics (Statics & Dynamics) | Mariam and Kraige |
| 3. Engineering Mechanics (Statics and Dynamics) | Timoshenko and Young |
| 4. Engineering Mechanics (Statics and Dynamics) | Sarbjeet Singh and Pardeep Singh. |

NOTE: There shall be total eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of calculator is allowed.

Examination to be held in the Year December 2022, 2023, 2024, 2025

BRANCH: COMPUTER/CSE/IT/E&C/ MECHANICAL ENGINEERING

CREDITS: 3

CLASS: B.E. 1st SEMESTER

COURSE TITLE – COMPUTER PROGRAMMING

COURSE NO.- CST3101

DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			THEORY	SESSIONAL
2	1	0	100	50

COURSE OUTCOMES : At the end of this course, students will able to :

CO 1	Understand various software development tools like algorithm, pseudo codes and flow charts for solving problems.
CO 2	Understand the use of loops and decision making statements to solve the problems.
CO 3	Apply different operations on arrays and user-defined functions to solve real-time problems.
CO 4	Analyze the operation of pointers, structures and unions.
CO 5	Implement file operations in C programming for a given application.

SECTION A

1. **Introduction to Programming (Flow chart/pseudocode, compilation etc.)**

Evolution of programming languages, the compilation process, object code, source code, executable code, fundamentals of algorithms, flow charts. (4 Hrs)

2. **Introduction to C, Data Types, Constants, Variables, Expressions, Statements, Operators, Data Input and Output** - Character set, Identifiers, Keywords, Data Types, Constant and Variables, Statements, Expressions, Operators, Precedence of operators, Input-output Assignments. (6 Hrs)

3. **Control Statements, Storage Classes, Library Functions.**

Control structures, Decision making and Branching, Decision making & looping.

Storage Classes: Types of storage classes, Scoping rules.

Standard Library Functions, advantages and use of various library functions (I/O functions, String, Character, Mathematics, Time and Date, functions). (10 Hrs)

SECTION B

4. **Functions, Arrays, Recursion, User Defined Data Types, Structures, Unions, Passing Structure to Functions.**

User defined and standard functions, Formal and Actual arguments, Functions category, function prototypes, parameter passing, Call-by-value, Call-by-reference, Nested function, Recursion.

One dimensional Array, One dimensional Array, 2- dimensional arrays: declaration and their applications, Searching in an array: Linear search and Binary search.

Sorting in an array: Bubble sort, Selection sort, Insertion sort, String Manipulation functions, Passing array to a Function, Declaration of structures, declaration of unions, pointer to structure & unions. (10 Hrs)

5. **Pointers, Operation on Pointers, Passing Pointers to Functions, Data Files – Opening, Closing, Creating Data Files**

Pointer variable and its importance, Pointer Arithmetic, passing parameters by reference, pointer to pointer, pointers to functions, Dangling pointer, dynamic memory allocation. Console input output functions, Disk input output functions, opening closing and creating Data files. (10 Hrs)

BOOKS RECOMMENDED:

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|--------------------------|----------------------|
| C How to Program, 7/e | - Paul J. Deitel |
| Programming With C | - Byron Gottfried. |
| Programming With C | - E. Balaguruswamy. |
| C The Complete Reference | - Herbert Schildt. |
| Let us C | - Yashwant Kanitkar. |

NOTE: There shall be total eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of calculator is allowed.

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